it should make no difference in the diagnosis warranted by other classical symptoms.

I have learned to know that it is very stupid to ever make a dogmatic statement in regard to pathological conditions of the human body. This has been brought home to me in connection with the disease of which we are speaking. I started a paper which I wrote about eight years ago with the remark that "all babies with congenital pyloric stenosis should be operated upon immediately." But in the last five years I am equally certain that more than half of them can, and have been cured by the proper use of thick feedings and atropin. This last fact, however, must not be allowed to encourage the unpracticed to resort to surgery altogether too late.

GUY COCHRAN, M. D. (1136 West Sixth Street, Los Angeles)—Doctor Chaffee has given us an excellent paper on this most interesting and important condition.

I feel, as Doctor Weeks does, that the x-ray is almost never indicated in these cases, nor is it imperative that a tumor be felt, for we have found several in which the pyloris lies high up under the liver or so deep in the abdomen that a tumor could not have been felt.

I regard pyloric stenosis as a medical condition which usually becomes surgical, so every patient is studied by both the pediatrician and surgeon. The majority of babies with this tumor, when first seen, have been allowed to advance so far that they are immediately surgical. The minority are treated medically.

When the infant continues to vomit or has lost 20 per cent of its body weight, or when dehydration is increasing, it is operated upon without further delay. We consider that all who have lost over 20 per cent of body weight, or in whom dehydration is marked, are bad surgical risks.

I follow the Fredet-Rammsted technic pretty closely. The pylorus is brought into the wound with a rubber covered, blunt hook so that the stomach is not handled at any time. An incision is made into the serosa the entire length of the tumor. This is then spread by blunt dissection with a mosquito clamp. The mucosa is entirely exposed but no attempt is made to cover it. These babies are kept warm on the table, they are given fluids before and after the operation to the greatest extent possible.

WILLIAM M. HAPP, M. D. (523 West Sixth Street, Los Angeles)—Doctor Chaffee's paper and the discussion is very timely as this condition is one where close co-operation between surgeon and pediatrician may save many human lives.

The diagnosis of hypertrophic stenosis from pylorospam is often very difficult. The latter condition is fairly common in young infants, usually responds to large doses of atropin and thick cereal feeding, and does not require operation.

The presence of a palpable tumor is very diagnostic of hypertrophy, but its absence does not eliminate the diagnosis.

It is not always necessary to operate as soon as the diagnosis is made. If the infant be in good nutrition and can be observed very closely, many of the milder cases recover under proper medical treatment. By this is meant close observation of weight, condition and stools, thick cereal feeding, re-feeding if vomiting occurs, occasional gastric lavage, atropin, and ample fluids. The patients who do best under this treatment are those in whom the spasm is more marked than the obstruction. If a short period of this regime does not cause improvement operation should be performed. Operation should not be delayed if the condition of the patient is not good, or if the patient cannot be closely observed.

Pre-operative and post-operative care is important. The stomach should be emptied before operation and fluids given. Salt solution always should be left in the peritoneal cavity at operation. Feeding should be begun very early after operation and ample fluid given by injection. Post-operative vomiting is no contra-indication to feeding.

If patients are placed under observation early when their condition is good, there should be a very low mortality. Mortality is due chiefly to failure of early diagnosis, permitting poor condition of the infant when first placed under treatment.

RADIATION TREATMENT OF SUPERFICIAL MALIGNANCIES

By ALBERT SOILAND * AND WM. E. COSTOLOW *

The chemical "paste" method of treating skin cancer has been discarded by practically all leading dermatologists and radiologists.

Thorough treatment of precancerous lesions is of prime importance.

Brass filtered radium is the preferable therapeutic agent in thick indurated skin epitheliomata.

Use of the cautery or electro-coagulation preceding radiation is unnecessary but after radiation may be of value in extensive sloughing skin lesions.

Malignancies of eyelids, nose and lip should be treated with radium exclusively.

Radium is practically a specific in treatment of the local lesions in epithelioma of the lip. The glands should be rayed immediately with x-ray, and surgery is indicated in addition in selected cases.

Radiation treatment of localized skin malignancy is as nearly specific as any procedure in the entire field of medicine.

DISCUSSION *by Carl H. Parker, Pasadena; Ernest K. Stratton, San Francisco; Edwin D. Ward, Los Angeles.*

THE large amount of literature, describing the successful treatment of superficial malignancies by radiation during the past ten years, has caused this method to be almost universally accepted. However, occasionally, someone attempts to discredit the use of radiation and advocates the ancient caustic methods. The caustic or paste method survives mainly as the armamentarium by which the cancer quack thrives.

The prophylactic treatment of malignancy is the most important aspect of the physician's duty. Not only the medical profession, but also the laity, should be educated as to the necessity of complete removal of all excrescences as warts, degenerated moles, persistent areas of eczema, keratosis and leukoplakia. The fact that all small epitheliomata can be readily removed by radiation should be emphasized.

A small superficial malignancy may be destroyed by any mechanical method which will entirely eradicate the nest of malignant cells. Various methods have been used with success since the barbers of Caesar's time used coals of fire and hot irons. Of course, certain local lesions may be destroyed by surgical operation, hot irons, electrocoagulation, chemical pastes, or caustics. The obligation is, however, to select the method which is easiest for the patient and most accurate and thorough from the scientific standpoint. We believe that radiation meets these requirements better than any other agent.

In the radiation treatment of superficial malignancy, either x-ray or radium may be used successfully. However, in certain types, radium seems to give the best results, its chief advantage being that

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* **William E. Costolow** (1407 South Hope Street, Los Angeles). M. D. University Pennsylvania. Practice limited to Radiology. Hospital connections: Hollywood, California, Lutheran, St. Vincent's and Santa Fe Coast Lines Hospitals, Los Angeles. Appointments: Lecturer in Roentgenology, Los Angeles Medical Department, University of California.

a more concentrated dose may be administered to a localized area.

In the treatment of small areas of keratosis which are breaking down, and of small localized basal celled epitheliomata, x-ray is specific. Usually one lightly filtered dose is all that is necessary. For the indurated thick lesions, however, as well as in most squamous celled growths, we believe better results are obtained by using radium. These growths are treated with radium tubes or needles, filtered by 1 mm. brass and 2 mm. rubber, giving a dosage of from 200 to 300 mg. hours per square cm. of lesion. The very thick and indurated lesions are treated at 1 cm. distance with the above method, giving from 1000 to 1200 mg. hours per square centimeter. It is preferable to divide this dosage over a period of three or four days, giving a few hours each day. Also, it seems better to use only about 50 mg. of radium to the square centimeter over a longer period of time, than to use a large amount of radium for a shorter period of time. This observation agrees with the recent work of Regaud in the radiation of testicular cells, in which he found that a large amount of radium applied for a short time led to central necrosis, leaving many cells near the periphery not sterilized; whereas a smaller amount, extended over a longer period, led to little or no necrosis, but a complete sterilization of all the cells.

We do not believe the single massive dose method has a place anywhere in the entire field of radiation. Apparently the divided dose method produces a tissue reaction which completely devitalizes the malignant cells without so completely devitalizing the normal tissues. After radiation there occurs, according to Ewing, a regression of the growth and a proliferation of the normal tissue. The cancer cells are not killed outright but succumb partly as a result of direct injury and to a greater extent from the defensive tissue reaction provoked in the normal tissues. The nuclei of the malignant cells are broken down and the chromosomes deranged, and the cells thus impaired surrounded by an area of lymphocytic infiltration with tissue proliferation. It is necessary to apply a sufficient, evenly distributed dose to all parts of the growth in order to obtain this change. It seems that the hard rays from heavily filtered radiation, given gradually, bring out this double reaction to the best advantage and with the least destruction of normal tissues.

We wish to mention the use of unfiltered radium implants and needles in the treatment of superficial skin malignancy, only to condemn it. The caustic reaction is too severe and often a slough is produced, this destruction preventing the normal tissue reaction which is so important in the eradication of the malignant cells. Often malignant cells may be found growing actively in the center of these sloughs. Superficial malignancy of the tongue constitutes an exception to the above. Here the use of needles and implants is the only treatment indicated. Apparently the difference is due to the fact that the tissues of the tongue are more vascular than those of the skin, the reaction of the normal cells better, and the repair much quicker and more certain.

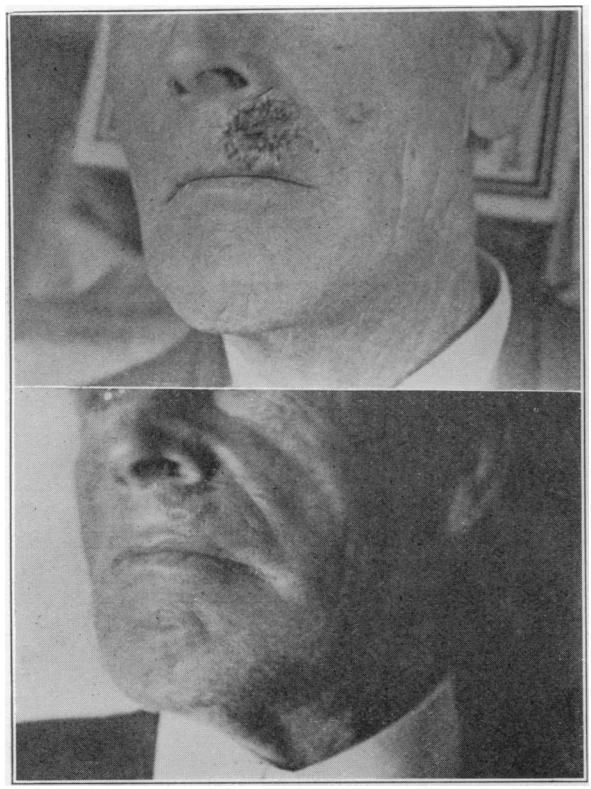
Radium plaques, which may be of great value in small superficial lesions, should not be used in treating deep infiltrating prickle-celled malignancies. Radium treatment has often been criticized unjustly because dermatologists have failed with a small radium plaque to treat successfully a lesion which should have been treated by the heavy filtered intensive method. Often the soft rays from the lightly filtered plaque will heal over the surface of the lesion and leave actively malignant cells in the base with the normal tissues so devitalized by the caustic action that further treatment is difficult and usually unsuccessful.

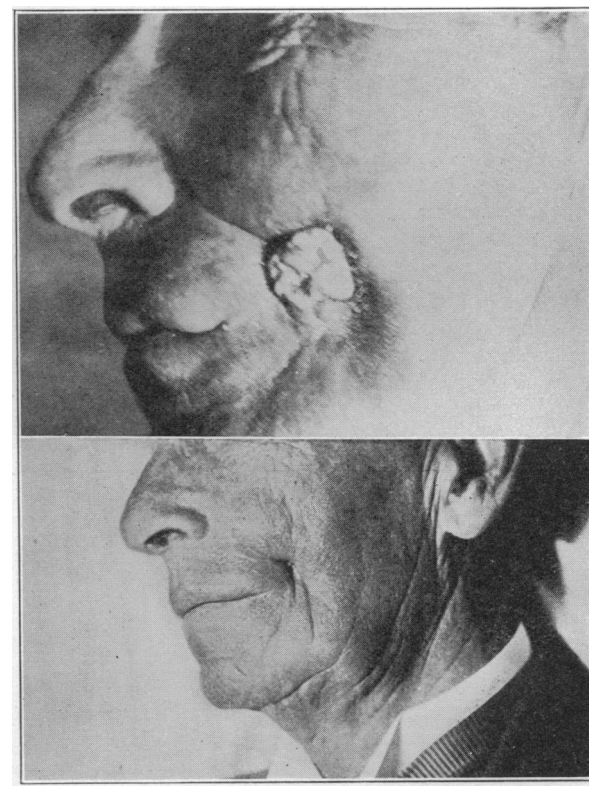
Malignant lesions which have once been treated, either by lightly filtered x-ray or radium, are not usually amenable to further radiation. However, we have seen a number of extensive skin lesions which had been treated unsuccessfully with lightly filtered x-ray, respond later to evenly distributed, heavily filtered radium treatment; but we have not seen the reverse of this, that is, an extensive lesion in which radium had failed, cured later by x-ray. Furthermore, patients who have been unsuccessfully treated by operation, caustics, cautery, are very difficult to treat later by radiation. This is undoubtedly due to the fact that the previous treatment has so devitalized the tissues, by destroying the blood and lymph supply and forming scar tissue, that the tissue reaction which is so important to obtain in the destruction of the cancer cells, does not occur. This is a point in favor of the theory that the radiation does not directly destroy the cancer cells but produces a tissue reaction which does the work.

The preliminary use of the cautery or electro-coagulation, advised by some in the treatment of skin malignancy, is seldom necessary. Following sufficient radiation, the outer portions of the growth soon dry up and slough loose and if the area is kept clean, this takes place without danger of skin infection. In large sloughing growths with marked mixed infection, as for instance, an extensive involvement of the ear, removal by electro-coagulation, followed by immediate thorough radiation, is indicated; or the procedure may be reversed. The treatment of several patients who appeared hopeless, in which the latter method was followed, has been entirely successful.

During the four years, 1920 to 1923 inclusive, 897 cases of superficial malignancy were treated in our clinic. As yet we have been unable to tabulate them for statistical purposes to our satisfaction, although the large majority have been traced. We feel that radium, properly filtered and applied in the treatment of lip and skin malignancies, is as nearly specific as any procedure in the entire field of medicine. Practically the only failures met with were in patients who were improperly treated with radium, x-ray or other methods previously, and the tissues thus devitalized.

In the series of cases treated, sixty-one were of malignancies of the eyelids or adjacent structures. These responded almost without exception and with very little resulting deformity. Malignancy of the eyelid should be treated exclusively with radium because by this method the dosage can be better





localized and there is less danger of producing injury or deformity of the eye.

Fifty-eight cases of epithelioma of the ear were encountered. The extensive cases of this group, where there was destruction of cartilage, showed rather poor results. The early cases responded almost without exception. The best results were obtained in the late cases by using radium filtered by 1 mm. of brass, .5 mm. of silver, 1 cm. distance and giving 800 to 1000 mg. hrs. per 2 x 2 cm. area, distributed over a period of several days. Many cases showed remarkable results with this technique and in no case were there untoward effects.

One hundred and eighty-one cases of epithelioma of the lip were treated and so far as we know, the original lesion was completely eradicated in all of them. Only four of these patients, to our knowledge, have died from glandular metastasis. Ap-

proximately 15 per cent of these lesions were recurrent after x-ray, chemical treatment, surgery and cauterization. We believe that radium will eradicate the local growth in all cases of epithelioma of the lip. The contributory lymph glands should be rayed immediately upon the institution of treatment and this combined with surgical block dissection in selected cases.

The skin malignancies located upon the extremities and trunk all responded to radiation with the exception of one case of extensive growth on the thigh, which responded for a time but later became painful and was cauterized. The ultimate result is not known.

In this series, about one-half of the cases—448—the lesions were located on the face: nose, cheeks, forehead and temple regions. The majority of these lesions were small and responded readily to radium or x-ray. The results were almost specific in all the superficial lesions of the nose. The deep lesions of the nose involving the cartilage produced the same difficult problem of treatment as the deep involvement of the ear. Here, as in similar involvement of the ear, the best results were obtained by using brass filtered radium at 1 cm. distance by the divided dose method. One striking case of extensive involvement of the entire end of the nose responded to a total dosage of 4000 mg. hrs., given over two 2 x 2 cm. areas and divided over a period of a week. The normal tissues were not damaged and are healthy and pliable.

DISCUSSION

CARL H. PARKER, M. D. (Professional Building, Pasadena)—I am substantially in agreement with the ideas expressed by Soiland and Costolow and I wish to lay a little added emphasis on their opening statements, with regard to prophylactic treatment. I believe that the average layman regards any cancer as an incurable disease and in fear of wasted effort, expense and pain delays treatment many months beyond the time when it should be begun. It is a fact often noted, that when a patient has a certain trouble, he hears of and comes in contact with many others having the same disease. Now, the point which I wish to make is that the best practical way of reaching the patient in need of prophylactic treatment is, by teaching the recently cured patient and urging him to spread the gospel of early treatment.

One other point is touched upon which is of great importance, in a successful management of malignant disease; namely, that the patient should be kept under observation, at suitable intervals, until the physician can be reasonably sure that a recurrence will not take place.

ERNEST K. STRATTON, M. D. (490 Post Street, San Francisco)—The excellent results observed by Soiland and Costolow in their treatment of nearly nine hundred cases of superficial malignancy show clearly what can be accomplished with radiation, when used properly. When radiation alone is depended upon, I, too, believe that the intensive filtered method gives the better results; I also believe that they are right in condemning the use of the massive dose method of unfiltered radiation, as I have seen quite a few cases of recurrences as well as considerable damage to the surrounding tissues following this kind of therapy.

From the viewpoint of a dermatologist, radiation is not always the method of choice in dealing with these excrescences, the so-called "precancerous" skin lesions or the epitheliomata. The reason for this is, that where equally good results can be obtained by other methods of therapy, such as with the curette alone, or with the curette and acid, or with the curette and unfiltered x-ray, or with electro-coagulation and desiccation, or as in some cases, with the electro-cautery, the size, number, type, and location of the lesions will sometimes influence him in his selection of one method rather than another.

While many dermatologists have only the dermatological plaque of radium, which is 10 mgs. distributed over a 2 cm. square, I believe they are cognizant of its limitations. I do not believe at the present time, however, that anyone would attempt to treat an epithelioma of the tongue or lip, or a squamous cell epithelioma of the glabrous skin with radium unless he had an adequate amount in the proper form.

EDWIN D. WARD, M. D. (Radium and Oncologic Institute, 1052 West Sixth Street, Los Angeles)—I agree with most of the essential points of this paper, although our technic differs somewhat from his.

We are in the habit of using less screening—less dosage, and where possible, bury the needles right into the malignant tissue. By this method one is able more fully to get the effect of the beta-ray, and correspondingly reduce the total dose.

This method delivers a maximum of radiation within the lesion with a minimum dose in the surrounding tissue and if your needles are so placed as to thoroughly treat the base, the method is effective unless metastases have taken place. If metastases have taken place, it is necessary to treat the entire surrounding area and regional lymphatics with some form of deep radiation. Either heavily screened radium or high frequency x-ray, and if your treatment of the lesion proper has been done in such a manner as not to allow much penetration of underlying tissues with the far-reaching gamma-ray, there is less danger of giving any area a double dose.

I do not mean to leave the impression that heavy screening is not desirable in a great many cases and many times preferable to light screening—but as a routine procedure. For superficial malignancies I prefer the light screening, say ¼ to ½ mm. of platinum.

DOCTOR COSTOLOW (closing)—I wish to express my appreciation for the generous discussion of our paper. Apparently Doctor Ward has misunderstood our stand on the matter of heavy screening. As we brought out in the substance of the paper, the clearly superficial lesions, which are the type most often met in routine work, may be easily eradicated by lightly filtered radium, x-ray, or as Doctor Stratton mentions, by curette, desiccation and electro-coagulation. The chief point we wished to emphasize in this paper, however, was that we believe all indurated skin malignancies or the ones which seem to penetrate deeply respond better with heavily filtered radium. We disagree with Ward that the effect of the beta-ray is desirable in these cases, on account of the caustic effect and the danger of after-trouble. With heavily screened radium, the skin is left in a better condition and one is better able later, in the case of metastasis, to use more heavily screened radium or the high voltage x-ray to which Ward referred. If the skin is not damaged by the first treatment, there need not be fear that later treatment will cause damage to the underlying tissues by double dosage, because in treating a skin lesion by the dosage we have outlined, the total amount of radiation received by the underlying tissues is not sufficient to produce any permanent change which would contra-indicate later deep treatment if necessary.

The Pacific Coast Oto-Ophthalmological Society meets in San Francisco April 26, 27, and 28, in the ballroom of the Hotel St. Francis. All men in the above specialties are cordially invited to attend. Kaspar Pischel is president and Hans Barkan, chairman of the Program Committee.

Members of the ophthalmological and oto-laryngological examining boards will be present, and doctors interested in attaining these certificates may come up for examination at that time.

Time flies, and barbers are chirotonsors, undertakers are morticians, wiremen are electrologists, and trusts are mergers.—Detroit News.